

What is claimed is:

- 1 1. An apparatus for treating ocular disease comprising:
 - 2 a locating means for non-invasively locating Schlemm's Canal in an eye, and
 - 3 a microsurgical device coupled with the locating means so as to advance the
 - 4 microsurgical device into a tissue space identified with Schlemm's Canal.
- 1 2. The apparatus of claim 1, wherein the microsurgical device is under control by the
 - 2 locating means.
- 1 3. The apparatus of claim 1, wherein the locating means comprises a device for
 - 2 ultrasound examination of the sclera.
- 1 4. The apparatus of claim 1, wherein the locating means comprises an ultrasound imaging
 - 2 system.
- 1 5. The apparatus of claim 1, wherein the locating means comprises a non-imaging
 - 2 ultrasound detection system.
- 1 6. The apparatus of claim 1, wherein the locating means comprises an ultrasound device
 - 2 for examination of the sclera with an ultrasound frequency greater than 10 MHz.
- 1 7. The apparatus of claim 1, wherein the locating means comprises an ultrasound device
 - 2 for examination of the sclera with an ultrasound frequency of at least 40 MHz.
- 1 8. The apparatus of claim 3, wherein the locating means utilizes an ultrasound contrast
 - 2 tracer introduced into the aqueous humor.
- 1 9. The apparatus of claim 1, wherein the locating means comprises a non-imaging
 - 2 ultrasound device for examination of the sclera.

- 1 10. The apparatus of claim 9, wherein the locating means comprises a transducer
2 assembly with signaling means for directing the transducer location.
- 1 11. The apparatus of claim 1, wherein the locating means comprises an optical imaging
2 device for non-invasively locating Schlemm's Canal in the eye.
- 1 12. The apparatus of claim 11, wherein the optical imaging device comprises a high
2 intensity white light illumination source.
- 1 13. The apparatus of claim 11, wherein the optical imaging device comprises an optically
2 coherent illumination source.
- 1 14. The apparatus of claim 11, wherein the optical imaging device comprises a fiber optic
2 device.
- 1 15. The apparatus of claim 11, wherein the optical imaging device utilizes detection via
2 visible wavelengths of light.
- 1 16. The apparatus of claim 11, wherein the optical imaging device utilizes detection via
2 infrared wavelengths.
- 1 17. The apparatus of claim 11, wherein the optical imaging device utilizes optical
2 imaging of a fluorescent tracer in the aqueous humor.
- 1 18. The apparatus of claim 1, wherein a tissue contacting surface of the locating means is
2 curved to approximate the surface of the eye.

1 19. The apparatus of claim 1, wherein a tissue contacting surface of the locating means
2 incorporates a circumferential raised portion to maintain placement of a coupling fluid
3 over a transducer face to aid in energy transfer between the locating means and the tissue
4 surface.

1 20. An apparatus for treating ocular disease comprising:
2 a non-invasive locating means for locating Schlemm's Canal in the eye, and
3 a microcannula coupled with the locating means so as to slidably advance into a
4 tissue space identified with Schlemm's Canal.

1 21. The apparatus of claim 20, wherein the microcannula has an outer diameter of less
2 than 200 microns.

1 22. The apparatus of claim 20, wherein the microcannula is coupled to the locating means
2 at an angle between 0 and 30 degrees from the plane of Schlemm's Canal in the eye.

1 23. The apparatus of claim 20, wherein an angle of the microcannula with respect to the
2 locating means is adjustable.

1 24. The apparatus of claim 20, wherein the locating means and the microcannula are
2 disposed within a unitary body.

1 25. The apparatus of claim 20, wherein the microcannula is coupled to the locating means
2 by way of a clip mechanism.

1 26. The apparatus of claim 20, wherein a distal portion of the microcannula is curved to
2 accommodate a curvature of Schlemm's Canal.

1 27. The apparatus of claim 20, wherein the microcannula incorporates a cutting tip to
2 penetrate a sclera of the eye.

1 28. The apparatus of claim 20, wherein the microcannula is comprised of an outer sheath
2 and an inner cannula.

1 29. The apparatus of claim 28, wherein the inner cannula incorporates a cutting tip to
2 penetrate a sclera of the eye.

1 30. The apparatus of claim 29, wherein the outer sheath is comprised of a rigid tube.

1 31. The apparatus of claim 29, wherein the outer sheath is comprised of a flexible tube.

1 32. An apparatus for treating ocular disease comprising:
2 a non-invasive locating means for locating Schlemm's Canal,
3 a microcannula which is linked with the locating means to advance the microcannula
4 into an identified tissue space for Schlemm's Canal, and
5 a dilation mechanism at the tip of the microcannula.

1 33. The apparatus of claim 32, wherein the dilation mechanism is comprised of an
2 expandable balloon.

1 34. The apparatus of claim 32, wherein the dilation mechanism is comprised of an
2 expandable tip on the microcannula.

1 35. The apparatus of claim 32, wherein the dilation mechanism is comprised of a series of
2 nested cannulae having successively larger diameters.

1 36. The apparatus of claim 32, wherein the dilation mechanism is comprised of an
2 elongate rod having steps of successively increasing diameters.

1 37. The apparatus of claim 32, wherein the microcannula is coupled coaxially with the
2 locating means.

1 38. An apparatus for treating ocular disease comprising:
2 a non-invasive locating means for locating Schlemm's Canal,
3 a microcannula which is linked with the locating means to advance the microcannula
4 into an identified tissue space for Schlemm's Canal, and
5 an implant which is delivered into Schlemm's Canal .

1 39. The apparatus of claim 38, wherein the implant comprises an expandable stent.

1 40. The apparatus of claim 38, wherein the implant comprises microparticles.

1 41. The apparatus of claim 38, wherein the implant comprises a drug releasing material.

1 42. The apparatus of claim 38, wherein the stent comprises a biodegradable material.

1 43. The apparatus of claim 40, wherein the microparticles comprise a biodegradable
2 material.

1 44. The apparatus of claim 41, wherein the drug releasing material contains a drug
2 effective in the treatment of glaucoma.

1 45. An apparatus for treating ocular disease comprising:
2 a non-invasive locating means for locating Schlemm's Canal,
3 a microcannula which is linked with the locating means to advance the microcannula
4 into an identified tissue space for Schlemm's Canal, and

5 a construct which is delivered through the microcannula to effect a surgical procedure
6 on a trabecular meshwork of the eye.

1 46. The apparatus of claim 45, wherein the construct comprises a surgical tool for cutting
2 tissues.

1 47. The apparatus of claim 45, wherein the construct comprises a fiber optic device.

1 48. The apparatus of claim 47, wherein the fiber optic device is an imaging fiber.

1 49. The apparatus of claim 47, wherein the fiber optic device is an illuminating fiber.

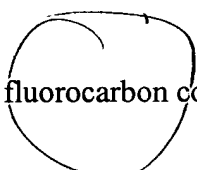
1 50. A method for surgically accessing Schlemm's Canal for treating ocular disease,
2 comprising:
3 locating Schlemm's Canal in an eye via non-invasive means;
4 advancing a minimally invasive surgical device into the canal guided by the locating
5 means;
6 delivering a substance for the treatment of the ocular disease.

1 51. The method of claim 50, wherein Schlemm's Canal is located using ultrasound
2 imaging.

1 52. The method of claim 50, wherein Schlemm's Canal is located using optical means.

1 53. The method of claim 50, wherein ultrasound imaging is utilized.

1 54. The method of claim 50, wherein non-imaging ultrasound guidance is utilized.

- 1 55. The method of claim 52, wherein high intensity white light is utilized.
- 1 56. The method of claim 52, wherein a coherent light source is utilized.
- 1 57. The method of claim 52, wherein visible light detection is utilized.
- 1 58. The method of claim 52, wherein infrared light detection is utilized.
- 1 59. The method of claim 50, wherein the surgical device is a cannula between 50 and 250
2 microns in diameter.
- 1 60. The method of claim 50, wherein the substance is a viscoelastic material.
- 1 61. The method of claim 50, wherein the substance is a gas. 7
- 1 62. The method of claim 50, wherein the substance is a fluorocarbon compound. 
- 1 63. The method of claim 50, wherein the substance comprises a drug releasing substance.